**Generation IV International Forum: Update**
**September 20, 2002**

The ten member countries of the Generation IV International Forum (GIF) have selected six next generation nuclear energy system concepts, known as Gen IV, to be the focus for collaborative research and development. The GIF, an international collective dedicated to the development by 2030 of the next generation of nuclear reactor and fuel cycle technologies, was announced by US Secretary of Energy, Spencer Abraham, on July 23, 2001.

The six Gen IV systems were selected by GIF with the help of leading international experts because of their significant potential to advance the sustainability, safety, economics and proliferation resistance of future nuclear systems. As well as electricity generation the plants offer potential for the generation of hydrogen from water for use in transport and for water desalination. All are considered deployable by at least 2030, with some possibly available as early as 2020. An interim report by GIF (attached) summarizes the concepts and the basis for their selection. The concepts include a sodium liquid metal-cooled reactor, very high temperature reactor, supercritical water-cooled reactor, lead-alloy-cooled reactor, gas cooled fast reactor, and molten salt reactor.

The selection of the concepts is the first stage in preparing a "Technology Roadmap" defining the research and development priorities to advance the Gen IV goals of sustainability, safety, economics and proliferation resistance. It is being jointly developed by GIF member countries to provide a structure for future international research collaboration that will help realise the new reactor concepts and will be published later in the year.

In addition to selecting Gen IV concepts, the GIF recognised a number of nearer term advanced reactor systems under development around the world. Some of these International Near Term Deployment systems will benefit the development of Gen IV systems through their own research and development. All are expected to be deployable by 2015, and to meet or exceed the performance of current light water reactors.

<u>Background notes: GIF Membership and Mission</u>

1. The member countries of GIF are Argentina, Brazil, Canada, France, Japan, Republic of Korea, Republic of South Africa, Switzerland, United Kingdom and United States. All are signatories to the GIF Charter. The Charter recognises expected increase in energy demand worldwide and the growing awareness of global warming, climate change issues and sustainable development. It establishes a framework for international cooperation in research and development for the next generation of nuclear energy systems (Gen IV) that will help meet this higher demand for energy supplies that are clean, safe and cost effective.

2. The world's population is expected to expand from about 6 billion people to 10 billion people by the year 2050; the World Energy Council projections anticipate energy consumption increasing by 100% or more in the same timeframe. Sustainable development recognises the use of energy supplies that are clean, safe, and cost effective and which reduce the prospect of global warming. The Gen IV initiative seeks to develop the potential contribution of nuclear as a future sustainable energy source. Its R&D programme also has an important role to play in maintaining and developing competence in nuclear technology and attracting young scientists into nuclear research area.

3. Current Generation II and III nuclear power plant designs provide large scale (about 16%) non-greenhouse-gas-emitting electricity supply safely throughout the world. Gen IV plant would achieve higher standards of safety and sustainability including potential for nuclear energy to be used for the generation of hydrogen for use as a transportation fuel and to desalinate water.

4. Most of the systems except the very-high temperature gas cooled reactor employ a closed fuel cycle to enhance sustainability, primarily through recycling of raw fuel material and the minimisation of long-lived radioactive material sent to waste repositories. The very-high-temperature gas-cooled reactor employs an open fuel cycle with very high fuel burn-ups and is primarily focused on the efficient production of hydrogen for transportation and petrochemical applications.

5. Participation in GIF and the selection process is aimed at identifying opportunities for international collaborative R&D and does not prejudge any member's national decisions on nuclear energy. Equally collaboration in Gen IV related projects is not limited to members of GIF.